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Applicant: Fufang Zha et al.
Serial No: 10/759,560
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For: SCOURING METHOD
Examiner: Sorkin, David L.
Art Unit: 1723

CERTIFICATE OF TRANSMISSION UNDER 37 C.F.R. § 1.8(a)

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/Nicole A. Palmer/
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APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Dear Sir:

This Appeal Brief is filed in response to the Advisory Action mailed on June 13, 2007 and in furtherance of the Notice of Appeal filed on July 9, 2007. A fee of \$500 under 37 C.F.R. § 41.20(a)(2) accompanies this filing.

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I. REAL PARTY IN INTEREST (37 C.F.R. § 41.37(c)(1)(i))

The real party in interest is the assignee of the instant application, namely Siemens Water Technologies Corp., a Delaware corporation with a place of business at 181 Thorn Hill Road, Warrendale, Pennsylvania 15086.

II. RELATED APPEALS AND INTERFERENCES (37 C.F.R. § 41.37(c)(1)(ii))

There are no appeals or interferences known to Appellant, Appellant's legal representative, or the assignee of the instant application that will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS (37 C.F.R. § 41.37(c)(1)(iii))

Claims 1-20 were pending in the application as filed on January 15, 2004. Claim 1 was amended in an Amendment filed on March 27, 2006. In an Amendment filed on November 8, 2006, claims 1 and 4 were amended. Claims 1-20 stand rejected, with claim 1 being in independent form. Claims 1-20 are being appealed herein.

IV. STATUS OF AMENDMENTS (37 C.F.R. § 41.37(c)(1)(iv))

No claim amendments were presented in a Response after Final filed on June 7, 2007. A copy of the claims as pending, incorporating all prior amendments and showing the status of each of the claims, is attached as a Claims Appendix beginning on page 9 of this Appeal Brief.

V. SUMMARY OF CLAIMED SUBJECT MATTER (37 C.F.R. § 41.37(c)(1)(v))

Aspects and examples of the claimed subject matter are generally directed to methods for forming openings in membrane pots for use in gas distribution. In one example, a method for forming at least one opening in a membrane pot is disclosed. The method generally involves providing at least one membrane having at least one membrane end, providing a mould for potting the membrane end, the mould comprising a base comprising an ejector portion and at least one formation for forming at least one opening in the membrane pot, filling the mould with a curable potting material, and positioning the membrane end in the mould. The method further involves allowing the potting material to at least partially cure, whereby the membrane ends are secured in the membrane pot, and raising the ejector portion to demould the membrane pot, the

membrane pot having at least one opening. (See [0047] to [0052] of corresponding U.S. Patent Application Publication No. 2004/0145076.)

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL
(37 C.F.R. § 41.37(c)(1)(vi))

A. Whether each of claims 1, 3, 4, 7-15, 17, 19 and 20 is patentable over Uchida et al. (JP 61-167407) (English translation previously submitted) (hereinafter “Uchida”) in view of Manspeaker (US 2,843,038) (hereinafter “Manspeaker”) where no proper *prima facie* case of obviousness has been established.

B. Whether each of claims 1-20 is patentable over Geary (US 3,442,002) (hereinafter “Geary”) in view of Uchida, and further in view of Manspeaker where no proper *prima facie* case of obviousness has been established.

VII. ARGUMENT (37 C.F.R. § 41.37(c)(1)(vii))

For the reasons provided below, the Examiner’s rejections are improper and should be reversed. Each of claims 1-20, as presented, is allowable.

A. Each of Claims 1, 3, 4, 7-15, 17, 19 and 20 is Patentable over Uchida in view of Manspeaker

Claims 1, 3, 4, 7-15, 17, 19 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Uchida in view of Manspeaker.

Uchida fails to disclose, teach, or suggest a method comprising, in part, providing a mould for potting the membrane end, the mould comprising a base comprising an ejector portion and at least one formation for forming at least one opening in the membrane pot, and raising the ejector portion to demould the membrane pot, as recited in independent claim 1.

Uchida discloses a process for the production of a hollow-fiber filtration membrane module utilizing a container 9 including side walls and bottom surface 12. (Uchida translation, page 4, third full paragraph and Fig. 2A.) The method includes installing holes 5 in the bottom surface 12 of the container 9, inserting rods or tubes 11 into the holes 5, and inserting hollow

fibers 2 into the container 9 through the container opening. A cross-linking resin is added to the container, covering the bottom of the fibers 2, but not completely covering the rods or tubes 11. The rods/tubes are removed to form throughholes to complete preparation of the filtration module after curing. (Uchida translation, page 3, last paragraph.) Container 9 is intended to be an integral component of the filtration module prepared by Uchida and is therefore not a mould as presently recited. Thus, in contrast to the method of claim 1, not only does Uchida fail to provide a mould, let alone a mould having a base comprising an ejector portion and at least one formation for forming at least one opening in the membrane pot, but Uchida is also silent as to a demoulding step.¹

One skilled in the art would not have modified container 9 of Uchida to include an ejector portion as asserted by the Examiner because Uchida's method does not involve demoulding. The proposed modification would impermissibly change a basic principle of how the Uchida process was designed to operate, namely formation of a filtration module without demoulding. Because Uchida does not demould the filtration module after curing, container 9 cannot be a mould as presently recited. Instead of serving as a mould, container 9 is intended to be an integral component of the filtration module prepared by Uchida as discussed above. In at least one embodiment, for example, container 9 of Uchida is an acrylic resin container which is filled with an epoxy resin for cross-linking bonding to form the filtration module. (Uchida translation, Brief Explanation of Fig. 2.) Nor does Uchida contemplate a demoulding step. While Uchida specifies that removable rods/tubes 11 inserted to form the throughholes are made of a nonstick or releasable material, such as a TEFLON[®] resin, no such disclosure is made regarding the material of container 9. (Uchida translation, page 4, third full paragraph.)

Furthermore, the proposed combination would impermissibly require substantial reconstruction of the Uchida container to allow ejection. More specifically, dedicated openings in base 12 of the Uchida container 9 would have to be added to cooperate with the ejector taught by Manspeaker in order to achieve ejection. Indeed, introducing an ejector into the existing holes 5 taught by Uchida would not be operative to enable ejection because the ejector would

¹ The Examiner's inference that Uchida teaches demoulding is not persuasive because it is based wholly on a comparison between roughly sketched schematics. (See Advisory Action at page 2, lines 2-4 ("it is seen that the mould (9) having bottom (12) shown in Figs. 2 and 3 is not present with the final module shown in Fig. 1.")) It is notable that FIG. 1 is intended to provide a cross-section of a disclosed filtration device in its entirety, rather than to offer any detailed view of a final potted portion thereof. (See Uchida translation, page 2, last paragraph.)

occupy areas vacated by rods 11 rather than exerting an ejection force. The addition of the required openings would in turn improperly render the Uchida container 9 unsuitable for its intended purpose because uncured resin introduced into container 9 of Uchida would be drained via such openings rather than retained for cross-linking.

Moreover, the use of Manspeaker is improper because Manspeaker is nonanalogous art despite the Examiner's assertion to the contrary.² Manspeaker is generally directed to a bakery assembly in which dough is molded for processing in commercial bakery operations. One skilled in the art would appreciate that the bakery apparatus of Manspeaker is in a different field of endeavor and is not reasonably pertinent to the formation of membrane modules for use in filtration. Due to the lack of commonality between the fields, as well as the unique design demands and constraints associated with membrane filtration modules, one skilled in the art would not have looked to bakery equipment art when seeking to form at least one opening in a membrane pot as presently recited.

Even if Uchida and Manspeaker could be combined in the manner asserted, the proposed combination still would not have resulted in a method for forming at least one opening in a membrane pot comprising providing a mould for potting the membrane end, the mould comprising a base comprising an ejector portion and at least one formation for forming at least one opening in the membrane pot. Instead, the combination would have resulted in providing a potting container as taught by Uchida, and an ejector as taught by Manspeaker that does not reside in the container base and therefore cannot operate as presently recited. The method would therefore also fail to include a step of raising the ejector portion to demould the membrane pot as presently recited because Manspeaker instead teaches pressing a base unit down against the ejector to release baked articles. Thus, Manspeaker fails to cure deficiencies in Uchida.

As such, independent claim 1 is patentable over Uchida and Manspeaker, either alone or in combination. Claims 3, 4, 7-15, 17, 19 and 20 depend directly or indirectly from claim 1 and are patentable for at least the same reasons.

² See Examiner's Answer at page 2, line 5.

B. Each of Claims 1-20 is Patentable over Geary in view of Uchida and Manspeaker

Claims 1-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Geary in view of Uchida, and further in view of Manspeaker.

Geary fails to disclose, teach, or suggest, a method comprising, in part, providing a mould comprising a base comprising an ejector portion and at least one formation for forming at least one opening in the membrane pot, and raising the ejector portion to demould the membrane pot, as recited in independent claim 1.

Geary generally discloses a method of manufacturing a fluid separation apparatus. In Geary, a plurality of hollow filaments is placed in a tubular casing assembly 101, to which a mold unit 905b is bolted to one end. (Geary, col. 21, lines 30-33.) A gasket is positioned between the casing assembly and the mold unit and the mold cavity surrounds the ends of the groups of filaments. The mold unit includes inlet means 908a which communicates with the mold cavity for the supply of the liquid molding material. (Geary, col. 21, lines 44-47.) During rotation of the casing assembly and attached mold, a solidifiable liquid is introduced into the mold cavity. (Geary, col. 21, lines 48-55.) The mold unit is removed from the cast wall member 950, exposing the cast wall member 950 for further processing. (See Figs. 16 and 17.)

One skilled in the art would not have modified the base of Geary's mold unit 905b to include an ejector portion as taught by Manspeaker. As discussed above, use of the nonanalogous Manspeaker citation is improper because one skilled in the art would not have looked to bakery equipment art when seeking to form membrane filtration modules as presently recited. The suggested modification would also unnecessarily complicate the design of mold unit 905b taught by Geary. Mold unit 905b is already easily removed from casing assembly 101 via bolts 906 to release cast wall member 950. Nor would an ejector portion be necessary to place openings in the membrane pot assuming *arguendo* that such a modification to Geary would be desirable as asserted by the Examiner. Furthermore, because the mold of Geary is bolted to the casing assembly containing the filaments, the proposed modification would improperly require substantial reconstruction and redesign of structural elements disclosed by Geary to operably incorporate an ejector portion in the mold base.

One skilled in the art would also not have modified the Geary method to provide openings in the membrane pot as taught by Uchida. In contrast to Geary, Uchida fails to disclose

use of a mold or a demolding step and therefore operates under principles inapplicable to Geary. Thus, one skilled in the art would not have modified the Geary mold to incorporate features of the non-removable potting cylinder of Uchida. Furthermore, one skilled in the art would not have modified the Geary method to provide openings in the membrane pot using removable rods/tubes that fit in base holes as taught by Uchida because the setup would be unlikely to withstand the centrifugal force applied during the Geary process.

Even if the references could be combined in the manner asserted, Uchida and Manspeaker still fail to cure the deficiencies of Geary with respect to the invention as recited in independent claim 1. As noted above in Section VII.A., any proper combination of Uchida and Manspeaker fails to disclose, teach, or suggest, a method comprising providing a mould comprising a base comprising an ejector portion and at least one formation for forming at least one opening in a membrane pot, and raising the ejector portion to demould the membrane pot. Instead, the combination would have resulted in providing a potting container as taught by Uchida, and an ejector as taught by Manspeaker that does not reside in the container base and therefore cannot operate as presently recited. Thus, no proper *prima facie* case of obviousness has been established because the proposed combination would lack at least one recited element.

As such, independent claim 1 is patentable over the cited combination. Claims 2-20 depend directly or indirectly from independent claim 1 and are therefore patentable for at least the same reasons.

C. Summary

In view of the above, each of the rejections is improper and should be reversed. Appellant respectfully requests reversal of the rejections and issuance of a Notice of Allowance.

VIII. CLAIMS APPENDIX (37 C.F.R. § 41.37(c)(1)(viii))

1. (Previously Presented) A method for forming at least one opening in a membrane pot, the method comprising:

- providing at least one membrane, the membrane having at least one membrane end;
- providing a mould for potting the membrane end, the mould comprising a base comprising an ejector portion and at least one formation for forming at least one opening in the membrane pot;
- filling the mould with a curable potting material;
- positioning the membrane end in the mould;
- allowing the potting material to at least partially cure, whereby the membrane ends are secured in the membrane pot; and
- raising the ejector portion to demould the membrane pot, the membrane pot having at least one opening.

2. (Original) The method of claim 1, further comprising: mounting the mould on a vertically movable platform.

3. (Original) The method of claim 1, wherein the formation comprises at least one upstanding pin mounted in a base of the mould.

4. (Previously Presented) The method of claim 1, wherein raising the ejector portion comprises raising a central ejector portion of the base.

5. (Original) The method of claim 1, further comprising:

- heating the mould to assist curing of the curable potting material.

6. (Original) The method of claim 1, further comprising:

- centrifuging the mould to assist penetration of the curable potting material into membrane fiber walls.

7. (Original) The method of claim 1, further comprising:
fitting a guide or collar around a periphery of the mould.
8. (Original) The method of claim 1, wherein the mould comprises a base having a plurality of upstanding pins.
9. (Original) The method of claim 8, wherein the upstanding pins are sized and distributed for correct gas bubble distribution.
10. (Original) The method of claim 1, further comprising:
positioning a plurality of membrane ends in the mould, wherein the membranes comprise hollow fiber membranes.
11. (Original) The method of claim 10, wherein the membrane ends are positioned uniformly in the mould.
12. (Original) The method of claim 10, further comprising:
sealing the membrane ends.
13. (Original) The method of claim 10, wherein the membrane ends are uniformly distributed in relation to at least one opening.
14. (Original) The method of claim 10, further comprising:
positioning the membranes in a sleeve that holds the membranes; and
inserting the membranes into a guide or collar around a periphery of the mould.
15. (Original) The method of claim 10, wherein filling the mould with a curable potting material is conducted prior to positioning the membrane ends in the mould.
16. (Original) The method of claim 10, further comprising:

fanning the membrane ends prior to positioning the membrane ends in the mould.

17. (Original) The method of claim 10, further comprising:

trimming the membrane ends to provide a uniform membrane length.

18. (Original) The method of claim 10, further comprising:

cutting the membrane pot transversely to open the membrane ends to facilitate withdrawal of filtrate from lumens during operation.

19. (Original) The method of claim 10, further comprising:

positioning a plurality of membrane ends in the mould so as to form an array.

20. (Original) The method of claim 19, wherein the array is a cylindrical array.

IX. EVIDENCE APPENDIX (37 C.F.R. § 41.37(c)(1)(ix))

None.

X. RELATED PROCEEDINGS APPENDIX (37 C.F.R. § 41.37(c)(1)(x))

None.

XI. CONCLUSION

For the reasons provided above, the rejections are improper and should be reversed. Appellant respectfully requests reversal of the rejections and issuance of a Notice of Allowance.

If there is any additional fee occasioned by this filing, including an extension fee that is not covered by an accompanying payment, please charge any deficiency to Deposit Account No. 50/2762, Ref. No. M2019-701440.

Respectfully submitted,
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